4. Evaluation Results by the Five Evaluation Criteria

4.1 Relevance

The Project's relevance is Very High (A) vis-à-vis the Mongolian national policies of meteorology sector, the needs of the target group, and the ODA policy of Japan.

The Project was planned to improve weather services in Mongolia through human resource development, which is in line with the 'Development Programme of NAHMEN on Meteorological and Environmental Sector by 2015', formulated under 'Action Plan of the Government of Mongolia 2004-2008 (APGM)'. The Programme also helped upgrade the meteorological facilities and the information network of national disaster for early warning. According to 'Japan's Country Assistance Programme for Mongolia', assistance for weather service is included under the theme of environmental protection. Therefore, the Project is consistent with both Mongolian national development policy and Japanese ODA policy.

The Project was aimed to respond to the needs of NAMHEM by identifying its staff as its main target group. The selection of the target group was appropriate because the improvement of weather services would not have been possible if their skills and knowledge in this sector had not been upgraded considerably.

4.2 Effectiveness

The effectiveness of the Project is also High (B).
It can be concluded that the Project has achieved to a great extent through successful introduction of new meteorological technologies which helped to improve the quality of weather services by enhancement of knowledge, skills and also sense of ownership and commitment.

Moreover, it has been considered that the 7 outputs have directly contributed to the Project Purpose and that the Project is directed towards the Overall Goal. A strong partnership between NAMHEM officials and Japanese Experts had contributed to the achievement of the Project Purpose. Their collective commitment and support to the Project implementation enabled them to embark on the new initiative and complete most of necessary activities on time. It was considered that this partnership in meteorological sector was based on the historical relation and trust built through the providing of Japanese Grant Aid

4.3 Efficiency

The Project's Efficiency is High (B), considering the conducted activities of each Outputs and planned inputs over the 3.5 year period. The quality, quantity and timing of the provision of most inputs were adequate, and were thus appropriately utilized to achieve the project outputs. The expertise of Japanese Experts was considered very adequate, according to CPs' response to the questionnaire survey. The equipment provided by the Project has been effectively utilized at the time of the evaluation. Furthermore, CPs were always able to obtain necessary technical guidance from Japanese Experts by e-mail, when Japanese Expert didn't stay in Mongolia. It appeared that continuous and holistic meetings have not been conducted sufficiently to monitor and confirm the achievements of the outputs and activities of the PDM.

The Mongolian side assigned appropriate CPs for carrying out project activities. Some of the activities were somewhat negatively affected by the transfer and the long overseas study of key personnel within NAMHEM. However, CPs are actively contributing to the project activities with a strong intent and accomplishment, and most of delayed activities have been recovered in the end. Regarding budget allocation from Mongolian side, an adequate cost has been allocated for the smooth implementation throughout the project period, for instance, NAMHEM provided the installation cost for DSS monitoring equipment and computer networking, renovation cost for the equipment room in NAMHEM head office, CPs' travel allowance for the pasture condition mapping and the regional workshops as well.

4.4 Impact

The Impact of the project is High (B). The positive impact at the policy and grassroots levels has been reported during the evaluation. A likelihood of the Overall Goal achievement is still limited at the time of the evaluation. It is recommended that both NAMHEM and the relevant ministries map out a concrete strategy reduction of on natural disaster and climate change impact by utilizing NAMHEM's weather information, which was transferred through the Project. For instance, the positive impact of the Project will be produced if the guideline for early warning system developed under Output 4 is approved by the Working Group for Evaluation on Drought and Dzud and utilized among the relevant ministries and agencies. Moreover, a positive impact was also reported from a CP working for Output7 that a CP has initially presented research outcomes based on DSS monitoring data at national and international conferences, and also strengthened research network with National Institute for Environment Studies of Japan.

The other positive impacts at the grassroots level, mainly from the implementation of

workshops at the pilot provinces, were observed during the site visits at Dundgobi and Khentii provinces. Interviews undertaken during the evaluation exercise confirmed that the degree of reliability and satisfaction in weather information has been increased, and their behaviours also has changed due to; (i) accuracy of weather forecast has been improved, (ii) weather information have been provided in detailed area.
There was no negative impact recognized so far during the Project.

4.5 Sustainability

Sustainability of the Project after the completion of the Project is Very High (A) based on the assessment from (1) the policy aspect, (2) the organizational and financial aspect and (3) the technical aspect.

- *Policy Aspect:* According to the 'Development Programme on Meteorological and Environmental Sector by 2015', NAMHEM has committed on the efforts to develop human resource, to improve the meteorological information and to establish a network system covering all the meteorological stations by 2015. Therefore, political support and commitment in the sector to sustain the Project effects will have been continued after the end of the Project.

- *Organizational and Financial Aspect:*

  - ✓ Having been the project implementation agency, the NAMHEM has fully institutionalized under the MNET with official mandates and responsibilities in the meteorological sector in Mongolia. Almost all CPs and engineers have been applying their knowledge and skills through the Project in the daily operation. Further, some of CPs have been conducting training for junior engineers to share technical expertise. Such internal human development activities would enhance the sustainability of NAMHEM.

  - ✓ The financial aspect of the Project has been at a satisfactory level. As shown in the table attached hereunder, budget expenditure toward NANHEM had steadily increased under the priority on the meteorological development in Mongolia. However, interviews with CPs and Japanese Experts confirmed that budgetary allocation for the maintenance of the equipment, especially DSS monitoring equipment provided under the Project should be secured by NAMHEM. Besides, one factor which may undermine the sustainability of the Project effects, especially in the field activities such as regional workshops and pasture condition mapping, is rising fuel costs. A

countermeasure should be taken to address the issue, for instance, enhancing and utilizing local human resource to conduct workshops.

Table: NAMHEM's annual budget and number of staff from 2005-2008

		2005	2006	2007	2008
Budget (million tugriks)		2736.3	3593.4	4490.0	8758.2
No of staff	Central	309	289	291	302
	Regional	1332	1930	1397	1941

Source :NAMHEM international cooperation division

➢ *Technical Aspect:*

✓ The sustainability of the skills and knowledge gained by the NAMHEM staff throughout the Project is considered high as the current CPs apply them in daily operations in NAMHEM. CPs and other engineers have been applying introduced technologies in the daily operation since technologies meet needs to fulfil their functions. CPs have gained considerable knowledge and experience in the meteorological operation in NAMHEM through the Project. Therefore, this secures a high technical sustainability to acquire and disseminate an advanced technology transferred from Japanese Experts.

✓ As for technical aspect on equipment maintenance, those materials and equipment have been properly maintained and used by the engineers with responsibility on their duties, and are expected to remain the same in the future.

4.6 Conclusion of Evaluation

The Project has been successful with a number of achievements. In order to improve the meteorological service of NAMHEM, a variety of activities was carried out under the Project with the emphasis on human resource development. Technology transfer to develop human resource of NAMHEM has been very fruitful to improve the quality of weather information and forecasting service. Though a few activities have not been completed at this point, CPs have already attained the level to continue and disseminate these knowledge and skills in their daily operation independently.

It was observed that the Project has enhanced the CPs' meteorological knowledge and skills, as well as the users' awareness and behaviours toward meteorological information through the regional workshops. To attain the Project's super goal in the future, it is hoped that NAMHEM will strengthen the relationship with related ministries and agencies, and show concrete directions for the role of meteorological sector in natural disaster management in the future.

5. Recommendations

1. Continuation of verification of outputs of numerical prediction model

Continuous verification of the outputs of the numerical prediction model should be done, and the results should be shown to forecasters. Forecasters shown the improved accuracy of the model would recognize its effectiveness, which would promote the operational use in weather services.

2. Publication of the Project's products

The Project has produced and will produce a variety of useful information on weather and climate for Mongolian people. Such information as improved weather forecast in accuracy and weather predictions and pasture growth data related to drought/dzud are much appreciated by the general public and nomads. Information on future climate change in Mongolia and case studies of past extreme weather which is scheduled to be produced by October 2008 should be made public and a concrete plan on when and how to publish the information be made as soon as possible.

3. Establishment of an early warning system on drought and dzud

Information on drought and dzud and pasture growth is very useful for Mongolian people, particularly nomads. Such information should be publicized timely as a great number of Mongolian people live on livestock raising and information related to drought/dzud is critical to their livelihoods.

NAMHEM plays a key role to timely evaluate and disseminate drought/dzud-related information to ministries and agencies concerned and nomads. NAMHEM should quickly establish an official system involving relevant departments such as IMH and ICC to do it and play a pivotal role to make an early warning system on drought/dzud within the government in cooperation with ministries and agencies such as MNET, MFA and NEMA.

4. Continuous conduct of seminars and workshops for users

Seminars and workshops conducted in Ulaanbaatar and the pilot provinces such as Khentii, Dundgovi and Gobi-Altai provided government officials and the general public with knowledge about weather and climate and deepened their understanding of weather and climate information. Such an opportunity is very important for weather information users to properly understand information disseminated by NAMHEM. Such seminars and workshops should be continuously conducted and the area of coverage should be

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extended to other provinces to cover the whole Mongolia.

5. Strengthening budgetary planning of NAMHEM

Although NAMHEM's budgetary provisions have shown significant improvement during the project implementation, in order to secure the sustainability to implement the project activities after the conclusion of the project, further budgetary strengthening is recommended.

In detail, budgetary plans for the following project activities/components are recommended to be reviewed and strengthened.

1) Budget for maintenance and operation of weather and sand/dust storm observation equipment.
2) Budget for upgrading technologies, e.g. in establishing new models for numerical weather prediction.
3) Budget for collecting data from weather observation stations and points all over the country.
4) Budget for development and distribution of meteorological information, by such means as manuals, pamphlets and websites.
5) Budget for conducting seminars and workshops for both NAMHEM staff and end-users of meteorological information in provinces.
6) Budget for development of pasture biomass and plant carrying capacity maps at the village (bag) scale.

6. Lessons Learned

1) The Project carried out much of its activities with CPs who have considerable level of expertise in the meteorological field in NAMHEM. Therefore, it is effective in terms of efficiency and sustainability to acquire and disseminate an advanced technology transferred from Japanese Experts. Additionally, those introduced skills and knowledge were practical and met their technical needs, which was a positive factor to promote CPs' sense of ownership and motives to apply their expertise into daily activities.

2) The Project was designed that most of the technical inputs by the Japanese side would be provided along with the dispatch of short-term experts. It has been noted that such project design presents some challenges in project management especially in regard to continuous monitoring of the Project's progress based on the planned activities and technical achievements. Sharing information of the Project progress and discussing problems for solution are essential exercises between Japanese Experts and CPs in project management. More close and regular communication between them would have produced further good results of the Project.